7A, and view the reproduced image with its viewing point "dv" coincided with the image shooting distance "df" of the parallax image data string D3, which, however, is not practical.

Therefore, the holographic stereogram producing device 10, when executing the image processing of the parallax image data string D3 by means of the image processing computer 16 in the image data processing unit 11, causes its viewing point conversion processing of the parallax image data string D3 to be carried out such that the reproduced image 60 may be constantly positioned in proximity to the hologram surface 51a of the holographic stereogram 51, and to generate a hologram image data D4, namely, an element hologram image data D5. Using the object light L2 undergone an image modulation by an element hologram image displayed on the transmission type liquid crystal display 29 based on the element hologram image data D5 subjected to the above-mentioned viewing point conversion processing and in combination with the reference light L3, the holographic stereogram producing device 10 exposes and records its holographic stereogram image on the hologram recording medium 4.

According to this viewing point conversion processing, in the holographic stereogram 51, as shown in FIG. 7B, its viewing point distance dv and the image shooting distance df of the parallax image data string D3 approximately coincide with each other, thereby enabling for the reproduced image 60 to be constantly positioned in the vicinity of the hologram surface 51a. Therefore, as shown in FIG. 7B, a clear and bright reproduced image 60 free from spatial distortion and blurring can be

reproduced in the holographic stereogram 51 advantageously without requiring for the observer to view with his/her eyes in contact with the hologram surface 51a.

The principle of the viewing point conversion processing of the invention for reconstructing the element hologram image data D5 will be described with reference to FIGS. 8 and 9, in which the element hologram image data string D5 comprising element hologram images d2 (d21, ----, d2n) of "n" pieces (sheets) is reconstructed from the parallax image data string D3 comprising element parallax images d1 (d11, ---, d1m) of "m" pieces (sheets), which were captured by the re-centering method described above.

The holographic stereogram producing device 10, which is provided with the image processing computer 16 as described above, displays element hologram images d2 based on the hologram image data D4 processed with the viewing point conversion processing, that is, the element hologram image data D5, sequentially on the transmission type liquid crystal display 29 for exposure and recording on the hologram recording medium 4.

With reference to FIG. 8, suppose that an element hologram image EH is exposed and recorded at its respective exposure point ep (ep1, ---, epn) on the hologram surface 51a of the holographic stereogram 51 which has a length "le" in the parallax direction, at this time a positional relationship between the element hologram image d2 of the element hologram image data D5 and the element parallax image d1 of the parallax image data string D3 is defined as shown in FIG. 8. By the way,

in this drawing, the horizontal direction is defined as the parallax direction. At each exposure point ep, an element hologram image d2 is exposed and recorded from the viewing point dv at an exposure angle θe. To simplify the explanation, only three points ep1, ep2 and epn are shown among the exposure points ep1, ---, epn. Needless to mention, the number of exposure points ep may vary depending on the lateral length le of the holographic stereogram 51 and a specified resolution of rendering in the holographic stereogram image, however, it is assumed, for example, that an equidistance pitch of 0.2 mm, and n=500.

A pitch Δle of each exposure point ep is equal to a pitch of the element hologram image d2, and has the following relationship (equation 1) relative to the lateral length le of the holographic stereogram 51.

$$le = n \times \Delta le \text{ ----- } (1)$$

Further, in the same drawing, "lc" denotes a shooting width of the parallax image data string D3 comprising the element parallax images d1 of "m" pieces (sheets), "dv" denotes the viewing distance, and "df" denotes the image capture distance of the parallax image data string D3. By the way, the pitch Δle of each exposure point ep and the image capture width Δlc of the element parallax image d1 are not always equal, however, the parallax distance dv and the image shooting distance df are set equal to each other. At each exposure point ep on the holographic stereogram 51, each of the element hologram images d2 sequentially displayed on the